

Running Head = THE EMBEDDED SELF

The Embedded Self: A Social Networks Approach to Identity Theory*

Forthcoming, *Social Psychology Quarterly*

Mark H. Walker

The University of Iowa

Freda B. Lynn

The University of Iowa

Corresponding Author:

Mark H. Walker, Department of Sociology, University of Iowa, Iowa City, IA 52242

Email: mark-walker@uiowa.edu

*We wish to thank Matthew A. Andersson, Jennifer Glanville, Steve Hitlin, Anthony Paik, and Sheldon Stryker for valuable comments and suggestions on various versions of this paper. An earlier version of this paper was presented at the 2011 annual meeting of the American Sociological Association.

Abstract

Despite the fact that key sociological theories of self and identity view the self as fundamentally rooted in networks of interpersonal relationships, empirical research investigating how personal network structure influences the self is conspicuously lacking. To address this gap, we examine links between network structure and role-identity salience. We identify two features of personal networks that potentially affect how social ties shape identity salience: (1) *proportion* and *strength of ties* to role-based others (RBOs), and (2) *embeddedness* of RBOs, or the breadth of access that a role-based group has to the rest of an individual's network. Across three role-identities (student, religious and work), we find that our measure of embeddedness predicts role-identity salience but that the proportion and strength of ties do not. Thus, our study does not support the proposition that identity salience is a product of an individual's social and emotional attachment to role-based groups. Rather, our findings suggest that a role-identity becomes more salient as role-based others become more tightly woven into an individual's social fabric.

Keywords

Identity, social networks, embeddedness, roles

According to most sociological theories of self and identity, roles serve as the interface between social institutions and the thoughts, motivations, and behavior of individuals who occupy positions in those institutions. The effectiveness of this link rests on the fact that there are culturally shared meanings and expectations attached to role-identities (Heise 1979; Burke and Tully 1977) and that these expectations become internalized into individuals' self-concept, thereby guiding the behavior of role occupants. The relationship, however, between roles and *behavior* is complex, often resulting in only a loose fit between role-expectations and role-performance (Turner 1962; Stryker 1968). In an attempt to reconcile this gap, theorists have drawn upon symbolic interactionist thought (Mead 1934), invoking the self as a mediating factor between role-expectations and individual behavior (e.g., Stryker 1968, 1980; McCall and Simmons 1966; Turner 1962). They argue that role-performances match role-expectations insofar as roles are *internalized* and become part of the self-concept.

What, then, facilitates the internalization of role-meanings? Previous work emphasizes social and emotional attachments to role-based groups (e.g., Stryker 1980; Stryker and Serpe 1982; Stryker and Burke 2000) as well as the rewards derived from investments in a role (Turner 1978; McCall and Simmons 1966). In this study, we develop a new argument about the how extent to which role-meanings are widely and routinely present in the social encounters of an individual is potentially vital in shaping the self-concept. The argument is tied to a concrete structural feature of personal social networks—the embeddedness of role-based others—that shapes the overall prevalence of role-meanings in our social worlds. In short, we argue that the structure of personal social

networks can affect which role-meanings are present in social encounters by increasing the likelihood that role-based others (i.e., individuals with whom interaction is based on role-occupancy) will be present in any given situation.

An innovative vignette question is used to engage respondents in a free recall task of their personal networks. The vignette question was designed to elicit a large sample of meaningful social ties, from which we are able to identify the structural locations of role-based others through a series of follow-up questions. In keeping with our structural theory of role internalization, our central hypothesis is that the overall embeddedness of role-based others in one's personal social network increases the salience of the identity associated with that role, independent of the social and emotional attachment to role-based groups. The results suggest that a deeper consideration of network structure does indeed improve our understanding of role internalization.

INTERPERSONAL TIES, SOCIAL ROLES, AND THE SELF

Sociological theories of self and identity generally view interpersonal social relations as an essential factor in the formation of self and role-internalization (Cooley 1902; Mead 1934). Commonly cited sources of role-internalization include the number of significant others an individual has role-based relationships with (Turner 1978), the amount of investment in the role-identity (McCall and Simmons 1966; Turner 1978) and the rewards that are derived from role-incumbency and successful role performance (McCall and Simmons 1966; Rosenberg 1979). Although many theories imply the importance of interpersonal social ties, identity theory (IT; Stryker 1980) is perhaps the most explicit

about the relationship between social ties and the self. Specifically, IT argues that role-expectations are internalized into the self-concept through commitments to role-based groups. Commitment is defined as social and emotional attachment to a role-based group, or the extent to which an individual's relationships to others are contingent upon possessing a particular role and identity:

Commitment, as a particularized translation of "society," focuses on social networks: the number of others to whom one relates through occupancy of a given position [and] the "importance" of others to whom one relates through occupancy of a given position... The concept of commitment can lead as deeply into social networks as a theorist is prepared to go (Stryker 1980:81).

Although this definition clearly recognizes the importance of social networks to self-structure, it nonetheless has galvanized a line of research in which commitment is typically measured *not* via actual network ties but rather by querying individuals' subjective assessments of the social and emotional loss they would incur were they to no longer inhabit a given role (e.g. Stryker and Serpe 1982, 1994; Serpe 1987). In fact, to date, social networks have been largely relegated to metaphor in identity research and the vast majority of empirical studies lack a detailed investigation of network structure (see, however, McFarland and Pals 2005 for a notable exception).

Consequently, the features of social networks that matter with respect to the formation of identities have received little empirical and theoretical attention. In this study, we attempt to remedy this issue by extending IT to examine the link between personal networks and the self using formal network methods. We thus build on the work

of Stryker and colleagues (Stryker 1980, Stryker and Serpe 1982, 1994; Callero 1985) by extending the concept of commitment “deeper” into social networks with an empirical investigation regarding the relationship between the structure of personal social networks and the self. Our formal network approach allows for the identification of two distinct features of personal social networks that could be affecting how social ties shape the self-structure: (1) social and emotional attachment to role-based groups, and (2) the embeddedness of role-based others in a person’s social circle. The *attachment* approach builds directly on the notion that a particular role-identity becomes more salient if one’s personal network is composed of numerous strong ties to others with whom we enact that role (Stryker 1980; Turner 1978). *Embeddedness*, in contrast, refers to the idea that role-identity salience may depend independently on the breadth of access (vis-à-vis social ties) that an individual’s role-based group has to the rest of her social world.

SOCIAL NETWORKS AND THE SELF-STRUCTURE

Previous research on self-concept formation tends to focus only on those relationships specific to a given role without considering an individual’s overall fabric of multiple roles and relationships. Here, we argue that the systematic investigation of the structure and content of personal social networks provides important information in that it allows us to examine how individuals’ role-based groups function in relation to other role-based groups in the *entire system* that is their personal social network.¹ The hallmark of social network analysis is to elicit the structure and content of actual social ties (i.e., to go beyond the metaphor) from which researchers can concretely analyze the structure of

social relations. The potential of this approach for the study of self and identity lies in the fact that our conceptualization of *why* social ties matter can be refined by taking a more rigorous approach to measuring the “importance” of role-based others in personal social networks.

First, social network analysis provides a more precise measure of the strength and number of ties to role-based others compared with the traditional methods of measuring ties to role-based groups. Researchers who employ social network analysis to study personal social networks use name generators to elicit the names of persons (alters) with whom the respondent (ego) has social ties, and ask the respondent a number of questions about the alters in their personal social network (e.g., McPherson et al. 2006, 2008; Marin and Hampton 2007; Wellman 1979). The name generator used here (see Marsden 1990, 2005 for a review of standard survey methods for network data) generates a notably extensive personal social network (mean = 17.83 alters), catalogs the strength of ego-alter ties in the personal social network, and elicits the ties *between* individuals in respondents’ personal social networks (alter-alter ties).

Second, name generators afford a more inclusive and representative look at respondents’ personal social networks than methods traditionally used to measure commitment. Rather than merely eliciting ties to role-based others, the name generator used in this research was designed to elicit meaningful social ties beyond respondents’ “inner circle” of social contacts, as well as to probe for additional role-based ties. Third, social network analysis offers a means of directly measuring the extent to which social groups are *interconnected*. Rather than examining role-based groups in isolation, a

network approach allows us to “see” the ties connecting a given role-based group to ego’s overall social landscape (i.e., extra-group ties), which we use as a measure of embeddedness.

For example, as depicted in network A of Figure 1, the commitment index used in previous research regarding the relationship between the self and the external social structure (Stryker and Serpe 1982) only gathers the ties that one has to role-based others. That is, the traditional approach focuses on the raw number of role-based alters within an individual’s personal network (e.g., in network A, ego has three role-based alters). Although counting role-based others is not problematic *per se*, it is possible that counts *alone* could be a misleading indicator of the presence of role-based others in ego’s social world.

[figure 1 about here]

Consider, for example, networks B – E, which illustrate the structure of four personal social networks that include role-based others *in addition to* non-role-based others (hereafter referred to as RBOs and NRBOs, respectively). Networks B and C indicate the information added by gathering non-role-based as well as role-based ties. Using traditional methods of measuring commitment, networks B and C would be considered equivalent with respect to the presence of RBOs, since both egos have three RBOs. However, by including NRBOs, B and C are no longer equivalent; half of B’s personal network is comprised of RBOs whereas only a quarter of C’s personal network is comprised of RBOs. Furthermore, networks D and E of figure 1 illustrate the different ways in which RBOs can be *embedded* in one’s personal social network. RBOs might be

relatively isolated from the rest of ego's personal network, as in network D, or they may be deeply "entrenched" in the rest of ego's personal social network, as in network E. Clearly, as illustrated by networks B – E, studying RBOs alone cannot distinguish between important ways in which the network composition of RBOs and NRBOs can differ across individuals. Thus, a more comprehensive approach to understanding social networks and identity salience involves gathering data on NRBOs as well as the ties between RBOs and NBROs.

Below we outline the properties of personal social networks that can be derived from IT's conception of commitment and propose how these features of personal social networks may operate in the internalization of role-meanings into the self-structure. Next, we discuss how the structure of personal social networks can affect the breadth of social encounters where role-meanings are relevant, which, in turn, can affect the extent to which a role is internalized into the self-structure. Again, we focus on two features of personal networks through which social networks may impact the self: (1) social ties as social and emotional investments and (2) social ties as creating webs of embeddedness.

Social And Emotional Attachment to Role-based Groups

One way that social networks might facilitate the internalization of roles into the self-concept is, as implied by IT and other theories of self (e.g., Stryker and Burke 2000; Serpe 1987; Stryker 1968, 1980; Stryker et al. 2005; Turner 1978), through the social and emotional attachments one has to role-based groups. This approach suggests that social ties are essentially investments that we work to maintain by living up to the self-

meanings that are attached to those ties. Commitment, then, may be thought to refer to the extent to which we are attached to role-based groups, either through the emotional closeness of social ties to RBOs or through how socially invested we are in a role-based group via the portion of one's social contacts that are based on a particular role. By this account, roles become internalized as salient identities because of the social and emotional investments that are "tied up" in role-based groups. Such an approach points to a bonding or binding mechanism (Borgatti and Lopez-Kidwell 2011), wherein one's social ties to role-based others serve as social and emotional investments that 'bind' them to the role-based group and, in turn, the self-meanings that are attached to the group.²

Hypothesis 1: An increase in the proportion of ties to role-based others will be associated with an increase in the salience of the identity associated with that role.

Hypothesis 2: An increase in the strength of ties to role-based others will be associated with an increase in the salience of the identity associated with that role.

The Embeddedness of Role-Based Others

A potential limitation of the attachment approach is that, while it considers the extent to which one's *social relations* are based on a particular role-identity, it does not specifically address the extent to which one's *social interaction* is based on a given role-identity. We argue that, although these two concepts may be empirically related, they are analytically distinct in that they suggest different processes underlying the link between

social networks and role-internalization. Focusing on identity-based interaction (rather than role-based ties) suggests that RBOs affect role-internalization by altering ego's social environment, rather than through inducing group commitment. Indeed, many theories of self highlight the importance of identity-based interactions for the self-structure. For instance, McCall and Simmons (1966) argue that the self-structure is largely a product of role-support, and suggest that the identities that can be reasonably invoked in any given social encounter are constrained by the "opportunity structures" available for self-verification. Opportunity structures in this sense refer to the types of role-performances that are likely to be supported by one's audience, and are largely determined by the identities of those present in the social encounter. Thus, since role-performance is largely a product of one's audience, we propose that role-internalization will be affected by the proportion of social encounters that consist of the type of audience that invokes the performance of a given role (i.e., social encounters that contain RBOs).

Additionally, the social and emotional attachment approach overlooks the essential fact that the people we are connected to may also be connected to each other. These alter-alter ties may matter for the way others in our social networks see us and, ultimately, the way we see ourselves. Indeed, extant research using social network analysis to study identity processes alludes to the importance of examining self-meanings as being shaped by ties between, rather than simply within, diverse social groups. For instance, McFarland and Pals (2005) show that identity imbalance (i.e., the extent to which self-held identities do not match the identities one's social contacts attach to them) is a dual function of a) an individual's location within the structure of social ties and b)

the extent to which an individual is tied to a diverse array of others from different “crowds.” They find that high school students who inhabit “structural holes” (i.e., students who have ties across various clusters of a peer network) are more likely to report an imbalance with respect to how they see themselves and their perceptions of how their peers see them. Importantly, then, this research highlights how identity is affected by both the overall *structure* of ego’s ties as well as the *differing identities* of ego’s social contacts. For example, identity imbalance is less likely to occur if ego is embedded in a densely knit group of others who see themselves in the same way that ego does, than if she is tied to others who are sparsely connected.

Building on these insights, we propose that the overall fabric or structure of a social network can inform us about the extent to which an individual’s interaction is based on a particular role-identity. In contrast to the idea that actors can be socially and emotionally attached to a role-based group, we ask whether the ties *between* the role-based group and the rest of ego’s personal network can shape role-identity salience and thus the internalization of a given role. There are two key ways in which the embeddedness of RBOs—a structural feature of a personal network—can affect the extent to which one’s interaction is based on a particular role-identity. First, embeddedness increases the probability that a RBO will be present in ego’s social encounters. For example, if Jane, a college student and member of a sorority, were to attend church weekly but keep her religious friends relatively separate from her sorority sisters and other friends (as in network D of figure 1), then she would likely only see her religious friends at church functions. Alternatively, if Jane’s religious-based alters were

extensively tied to her sorority sisters (as in network E), then it is likely that her religious friends would be present at sorority functions as well as at other social outings she attends.

Second, having RBOs and NRBOs present in the same social encounter can also facilitate the diffusion of role-meanings to others in ego's personal social network, due to the fact that *observing and participating in* role-performance sends a stronger and more clear signal of "who Jane is" than merely knowing about role-incumbency.³ In addition, successful role-performances imply that the social actor negotiates a definition of the situation wherein those present in the social encounter come to see (or are perceived to see) the actor in a way that reflects the actor's self-held role-meanings (Burke and Stets 2009). Thus, the very nature of role-performance in the context of self-verification suggests that ego is actively engaged in trying to convince NRBOs of her legitimacy as a role-occupant. As a result of this sustained, careful identity work, the co-presence of RBOs and NRBOs in social encounters serves the dual function of bringing role-based meanings into the social encounter and facilitating the diffusion of role-meanings to the NRBOs involved in the social encounter, and should contribute especially to identity salience.

The above discussion underscores an important difference between the way embeddedness is conceptualized here (as an alter-alter phenomenon) and the way it has been employed in previous research. Sociologists have long recognized the importance of embeddedness for individual outcomes (Granovetter 1985; Portes and Sensenbrenner 1993; Moody and White 2003) but have focused primarily on embeddedness from the

perspective of ego-alter relations. For example, a key theme that emerges from the economic sociology literature on embeddedness is how ties between firms reduce transaction costs and uncertainty in market transactions (Granovetter 1985) and long-standing relationships facilitate fine-grained information transfer in a way that “arms-length” relations cannot (e.g. Uzzi 1996, 1999). Other embeddedness research focuses on the link between node connectivity and social cohesion (Moody and White 2003); a student who is highly embedded (i.e. densely intertwined) in a group of friends at school is expected to report being more attached to her school.

In contrast to focusing on how individuals are embedded in groups, we take what is essentially an alter-based approach to embeddedness. That is, our conception of social fabric is based on alter-alter ties as opposed to ego’s relations with various alters. Such an approach is intended to capture how “involved” or “active” certain group members are in an individual’s overall social life. We do not mean this in the colloquial sense of “being involved in someone’s life,” as a parent who participates in parent-teacher conferences or supervises homework is involved in his or her child’s life. Instead, embeddedness here taps into the idea that a given friend or partner has the potential to be more/less entrenched or involved in ego’s social circle (and consequently, more/less able to exert influence or constrain ego’s identity formation) to the extent that s/he is directly tied to the others ego knows.

An important feature of our theory of embeddedness is that it describes how role-meanings can transcend beyond the organization in which they are embedded (e.g., church, the workplace, school), and extend to social encounters outside the institutional

setting. We argue that social ties connecting RBOs to NRBOs can breakdown the institutional boundaries that can keep role-meanings localized in the relevant institutional setting. For example, our theory can account for how people outside of ego's religious congregation can come to associate religious meanings with ego, without viewing ego as the (sole) agent for this process.

In sum, we hypothesize that it is not simply the proportion of RBOs that matters for identity salience but the "reach" those RBOs have into an individual's social fabric. An increase in the breadth of ties a role-based group has to the rest of ego's social network likely increases the proportion of social settings for ego that contain self-relevant meanings associated with a given role; if RBOs are tied to a large portion of ego's social network, then they are likely to be invited to the same parties, frequent the same restaurants and bars, and attend many of the same social functions as ego. This serves to alter the opportunity structures available for identity verification, which, in turn, makes self-verification increasingly contingent upon the successful enactment of a given role-identity. The drive to verify identities and the emotional gratification one experiences through identity verification (Stets 2005) should result in the internalization of the identity (i.e., an increase in the salience of the identity associated with that role).

Hypothesis 3: An increase in the embeddedness of role-based others in ego's personal social network will be associated with an increase in the salience of the identity associated with that role, net of social and emotional attachment to the role-based group.

In summary, our embeddedness approach suggests that network flow and adaptation processes are at play in the relationship between social networks and role-internalization (Borgatti and Lopez-Kidwell 2011). In contrast to the idea that social ties induce group commitment, our theory of embeddedness proposes that the embeddedness of role-based others affects the social environment of an individual (i.e., the opportunity structures for self-verification), which, in turn, causes individuals to adapt by constructing interactional strategies for self-verification that include behavior that aligns with the relevant situational role-meanings and expectations. Additionally, this approach acknowledges that the effect of embeddedness on an individual's social environment can be amplified by the diffusion of role-meanings throughout the individuals' personal social network.

Below we test the above three hypotheses across three role-identities using detailed personal network data from a sample of young adults (18-24 year olds). Following previous work in identity theory (e.g., Stryker and Serpe 1982, 1994; Burke and Reitzes 1991, Stryker et al. 2005), we examine the impact of personal social network structure on the salience of the student, religious and work identities. The data we collect allows us to measure the proportion of ties to RBOs, the emotional strength of those ties, and the embeddedness of role-based groups within respondents' overall networks.

DATA & MEASURES

Data on personal social networks were collected via an online survey for a national sample of 198 young adults who were between 18-24 years old and childless.⁴

As shown in table 1, the sample is mostly white (69.7%), female (55.05%), and roughly 22 years old on average. About 30% of the respondents had a Bachelor's degree or higher and the average respondent had about 2 years of college education. Respondents tended to originate from middle-class families (mean parental income = \$66,020; sd = \$52,133). The questionnaire is given in Appendix A.⁵

[table 1 about here]

Personal social networks

The name generator is the standard method of enumerating an individual's personal social circle (Marsden 2011, Marin and Hampton 2007). Following a recent push to elicit extensive personal social networks (e.g., Marin and Hampton 2007; Marin 2004; Hogan 2007, Mollenhorst, Völker and Flap 2007, 2008), the name generator used in this study (also see Appendix A) is designed to elicit more than just the "inner circle" of social contacts who matter in the respondents' lives (i.e., both weak and strong ties). Indeed, our goal is to elicit wide-ranging personal social networks that potentially include ties to individuals from multiple sectors of social life. To this end, respondents are presented with a vignette-style name generator plus a set of probes for additional interaction partners (see appendix A for the survey protocol).

Eliciting network alters. Following informed consent and a short series of questions on school and church participation, respondents are presented with a vignette-styled question about their social networks along with visual instructions:

We want to learn about the people in your life. Imagine that you have won an award that you are very excited about. Those presenting the award to you want to

throw a party in your honor. They will pay for all of the expenses related to the party, including food, drinks, travel and housing for guests. Who would you invite?

On the following screen, the question is repeated and respondents are given 25 blank text boxes where names can be entered. Respondents are instructed to input only first names and last initials and reminded that duplicates are not allowed (see appendix A for exact wording). We refer to this as the respondent's "guest list" of alters.

Since pilot data indicated that this name-eliciting vignette tended to generate strong ties (Walker 2010), additional probes are used to identify alters with whom the respondents were less close but still had meaningful relationships with in their everyday lives. Thus, after respondents generated their guest lists and completed a set of name interpreters (see the discussion below), they are prompted to name any additional contacts that they "interacted with on a regular basis" but who were not currently on the guest list. For example, if respondents reported attending religious services at all, (i.e. all responses except for "Never"), they were asked to identify other religion-based contacts that were not yet on the guest list:

Can you think of other people who attend the same religious services as you that you see or talk to on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them).

These questions were then followed by a set of name interpreters for these probe-based alters (see appendix A part 5).

Alter-alter relationships. To gather the structure of alter-alter ties in respondents' personal social networks, respondents were asked to indicate which of the alter pairs know each other "well enough to stop and chat if they passed one another on the street" (check box if "yes"). This threshold of "knowing" is similar to that used in the GSS (2006) "Number Known" module on social capital (see DiPrete et al. 2011). The alter-alter questions are divided into four categories: 1) guest dyads, 2) within-role contact dyads, 3) guest-contact dyads, and 4) between role-contact dyads (see appendix A parts 6, 8, 9, and 11 respectively).

Subgraphs and role-based groups. Once the personal social networks were generated, role-based name interpreters (McCallister and Fischer 1978; Marsden 1990, 2005) were used to generate role-based subgraphs (see appendix A, parts 3 and 5). These role-based subgraphs contained only the alters in the respondent's personal social network who had a particular role-based relationship with the respondent. For example, the religious subgraph is generated by asking the respondent to indicate which of his/her alters attend the same religious services as they do. Following previous work in IT, social ties based on the student, religious, and work roles are generated (e.g., Stryker and Serpe 1982; Burke and Reitzes 1991; Nuttbrock and Fruediger 1991).

Identity Salience

Identity salience is defined as the probability of enacting an identity in and across social situations (Stryker and Burke 2000). Following previous work in identity theory (e.g., Stryker and Serpe 1982; Stryker and Serpe 1994; Serpe and Stryker 1987; Merolla et al.

2012) identity salience is measured by asking respondents how likely it is that they would invoke each identity in a number of different social situations. Specifically, they were asked how likely they would be (1=very unlikely; 6=very likely) to mention each aspect of self (i.e., work/career, school/academics, and religion or church activities) in four different social situations: 1) meeting a roommate for the first time, 2) meeting someone at a party, 3) meeting a friend of a close friend, and 4) giving a short speech about oneself. The salience of each identity is measured as the mean value of a given identity across all four social situations. The salience items for the religious, student and work identities each load on a single factor and are within acceptable levels of scale reliability ($\alpha=0.91, 0.84, \text{ and } 0.82$ respectively).

For the identity salience measures, respondents are asked to consider five identities even though our analysis is focused on explaining only the religious, work and student identities. Of the five identities (family, work, religion, friend, student) that have been most commonly studied by identity theorists (Stryker and Serpe 1982, 1994; Stets and Biga 2003; Stets et al. 2008), only three (religion, work, and student) are relevant to the scope of our theory (i.e. that embeddedness should be relevant for identities associated with institutions (e.g. churches, workplaces, schools) given that the reach of role-based others (social ties) can transcend these boundaries).⁶

Social and Emotional Attachment

Social attachment for each role-based group is measured as the proportion of ego's personal network who are RBOs. For example, social attachment for the religious identity

is measured as the number of alters that ego indicated as attending the same religious services as they do (i.e., the size of the religious subgroup) divided by the total number of alters in the network. In addition, respondents were asked to indicate how close they felt to each alter, emotionally (not very close=1, extremely close=4). Emotional attachment to a given role-based group is measured as the average strength of ties between ego and members of the role-based group.

Embeddedness of Role-based Group

We conceptualize embeddedness of role-based others as the breadth of access the role-based group has into ego's overall social fabric. Thus, we measure embeddedness by calculating the proportion of ego's personal social network that is composed of either RBOs or those who are socially tied to the role-based group. To illustrate, we display the personal social networks of two respondents (figures 2 and 3) with ego excluded. The networks in figures 2 and 3 have role-based groups that are proportionally similar in size ($5/19 = 0.26$ and $9/32 = 0.28$, respectively), but differ dramatically in their level of embeddedness ($(5+13)/19=0.95$ and $(9+1)/32=0.31$, respectively). This is due to the fact that a vast majority of the NRBOs in figure 2 are tied to a member of the role-based group (only one alter is isolated from the role-based group), while in figure 3 the role-based group is nearly isolated from the rest of ego's personal social network save for one NRBO bridge. This measure thus reflects the "reach" of the role-based group in the respondent's social network in that it captures the proportion of ego's social landscape that RBOs have access to.⁷ To be sure, our measure of embeddedness is also empirically

distinct from social attachment. Table 2 shows that the correlation between embeddedness and social attachment ranges from low to moderate for the three roles under study.

[figures 2 & 3 and table 2 about here]

Role-Behavior

Role-behavior for each identity is also included in our analysis to address the possibility that the relationship between network variables and identity salience is spurious. For example, it may be that the frequency of attending religious services both increases how much one identifies as a religious person and the extent to which one's personal social network consists of religious people. Further, frequent attendance of religious services may, over time, increase the extent to which religion-based alters are connected to non-religious alters in ego's personal network through processes of transitivity (Holland and Leinhardt 1972, 1977); religious attendance could be driving both the salience of the religious identity and connecting religion-based alters to the rest of ego's personal network. Traditionally, role-behavior is thought to be an outcome of identity salience (Stryker 1980), but at times role-behavior can be constrained by external forces or may be a product of other situational contingencies. For example, the amount of time one spends studying outside of school may be due to a demanding major or a heavy course load, and the number of hours one works likely has to do with economic considerations and other role-obligations. Since we are primarily concerned with isolating the relationship between network structure and identity salience, we include measures of role-behavior in our models to rule it out as a possible confound.

To measure religious role-behavior, respondents were asked to report on the frequency with which they attend religious services (“never, less than once a year, once or twice a year, several times a year, about once a month, 2-3 times a month, almost every week, every week, several times a week”).⁸ Our measure of student role-behavior is respondents’ self-reports of the amount of hours per week they spend outside of class doing schoolwork and our measure of work role-behavior was the reported number of hours per week respondents work for pay.

ANALYTIC PLAN

In order to test the hypotheses outlined above, we estimate separate ordinary least squares (OLS) regressions predicting the religious, work and student identities. For the religious identity, three models are estimated: model 1 is a baseline model estimating the extent to which religious identity salience is related to role-behavior and other control variables. Seven control variables are included (race [White/non-white], age, gender, years of education⁹, marital status [married/not married], parental income, and network size) to address the possibility that demographic factors may affect salience (e.g. Benson, Donahue, and Erickson 1989; Wilson and Sherkat 1994) as well as network structure (Moore 1990; Lin and Dumin 1986; Lee, Campbell, and Miller 1991). In model 2, we also include the social and emotional attachment variables. Finally, model 3 estimates the effect of the embeddedness of RBOs on religious identity salience, net of demographic characteristics, role-behavior, and measures of social and emotional attachment to the

role-based group. We then run the same three models for both the student and work identities.

Due to the scope of our theory and the nature of the indices used for our network-based analyses, we restrict our sample based on two conditions. First, in each model we restrict our sample to those who participate—at some level—in a social institution where the relevant role is embedded. For the religious identity, those who indicate that they never attend religious services are not included in the analysis predicting religious identity salience. Likewise, only respondents who indicate that they are currently enrolled in school (employed) are included in the analysis predicting student (work) identity salience. These restrictions reflect the fact that our theory of embeddedness addresses how social structure increases/decreases role-identity salience for those whom the role is applicable; the theory, however, is not well-equipped to deal with why some choose to adopt a role and others do not. Second, since the average strength of ties to role-based others can only be calculated if there is at least one RBO in their personal network, only respondents with one or more role-based tie are included in the analyses.¹⁰

[table 3 about here]

RESULTS

Table 3 shows that the networks generated using this method were quite large (mean=17.83; sd=9.91), moderately dense (mean=0.40; sd=0.17), and moderately close (mean=2.61 on a scale from 1 to 4 for emotional closeness; sd=0.52). This indicates that the name generator used in this study tended to elicit relatively extensive personal

networks with moderate levels of connectivity and ties that range from emotionally intense to weak. For the average social network, slightly more than half of the ties are reported as “close” or “very close” (see table 3). Roughly 30% are reported as “somewhat close” and 16% are “not at all close.”

[table 4 about here]

Beginning with the religious identity, table 4 shows that religious-based subgroups constitute a relatively small portion of personal networks, but have higher levels of density than personal networks as a whole. This is consistent with the clustering that one would expect of meaningful subgroups in personal networks. For people who attend religious services ($n=129$), the religious subgroup tends to consist of just under 5 alters (mean=4.67; $sd=5.51$), and constitutes about a quarter of their personal social network (mean=0.24; $sd=0.24$). The religious subgroup tends to be quite dense (mean=0.687; $sd=0.324$) and respondents report being, on average, “close” to their religious contacts (mean=3.01; $sd=0.71$). Finally, respondents with religious subgroups tended to display moderately high levels of embeddedness—on average 57.9% of alters in respondents’ personal social networks either attend the same religious services as ego or are tied to a religion-based other. To be sure, however, there was non-trivial variation across respondents in the extent of religion-based group embeddedness ($sd=37.8$ percentage points).

With respect to the student identity, respondents who were enrolled in school ($n=90$) had an average of just over three alters in their student subgroup, which comprised about 18% of their personal social network (see table 4). This subgroup tended

to be slightly less dense than the religious subgroup (mean=0.575; sd=0.38), and the average strength of ties to the student subgroup was slightly lower than the religious subgroup (mean=2.87; sd=0.78). Finally, similar to the religious subgroup, embeddedness for the student subgroup was 52.4% on average (sd=34.5 percentage points). Of the three identities, the work subgroup tended to be the smallest (mean=2.36) and displayed the lowest amounts of closeness and embeddedness (see table 4).

[table 5 about here]

The results of the OLS regression predicting religious identity salience are reported in table 5. Model 1 indicates that controlling for other demographic variables, frequency of religious attendance and marital status are the only control variables that significantly affect religious identity salience. Controlling for other variables in the model, individuals who reported attending religious services “nearly every week” or more had a 1.331 more salient religious identity than those who attended “less than once a year” ($p<0.001$). Additionally, married respondents tended to have more salient religious identities than non-married respondents ($p<0.05$), although this relationship becomes non-significant when social and emotional attachment variables are included in the model (see model 2).

Model 2 indicates the impact of the social and emotional attachment variables, showing that, controlling for religious attendance and other control variables, the strength and proportion of ties to religion-based others do not significantly impact the salience of the religious identity, providing a lack of support for hypotheses 1 and 2. This suggests that simply being tied to a proportionally large number of religious others is not enough

to increase the salience of the religious identity, nor is being emotionally close to religion-based others.

Model 3 shows that, as hypothesized, the extent to which religious-based alters are connected to the respondent's overall personal social network significantly increases the salience of the religious identity ($p=0.035$), net of demographic variables, frequency of religious attendance, and social and emotional attachment. This indicates that, controlling for other variables in the model, a 0.10 increase in the embeddedness of religious-based others is associated with an increase of 0.12 in religious identity salience, providing support for the embeddedness hypothesis (hypothesis 3). To illustrate, we would expect a network with embeddedness levels corresponding to that in figure 2 (0.95) to have a religious identity salience that is 0.77 higher than a network with embeddedness levels that correspond to those in figure 3 (0.31).

[tables 6 & 7 about here]

To test hypotheses 1-3 for the student and work identities, we run models analogous to those in table 5. However, for the sake of brevity we only discuss the coefficients for social and emotional attachment and embeddedness. As with the religious identity, model 2 of tables 6 and 7 show that social and emotional attachment variables have no statistically significant effect on the salience of student and work identities (see tables 6 and 7, respectively). However, the embeddedness of role-based others is associated with an increase in the salience of the student identity ($p = 0.040$) as well as the work identity ($p = 0.028$), providing additional support for hypothesis 3.

Overall, the results suggest a consistent relationship between the embeddedness of RBOs in respondents' personal networks and identity salience. For the student, work and religious identities, the breadth of ties between RBOs and the rest of ego's personal social network is associated with an increase in identity salience, net of role-behavior, the proportion of ties to RBOs and the strength of those ties, as well as other demographic variables. Two findings that are consistent across both sets of models are especially noteworthy: 1) neither the proportion of ties to RBOs nor the strength of those ties has an effect on identity salience and 2) the embeddedness of the role-based group is positively related to identity salience, independent of the proportion of ties to RBOs and strength of those ties.

Although the embeddedness coefficients are relatively modest in size, there are a number of features of our analytic strategy—such as the fact that we control for role-behavior as well as the proportion and strength of ties—that likely result in conservative estimates. Overall, these findings do suggest that something beyond the dyadic relationships between ego and RBOs is affecting identity salience. The fact that we observe this relationship independent of the proportion and strength of ties to RBOs suggests that the reach that a role-based group has into respondents' social fabric is more consequential for identity salience than social and emotional attachment to RBOs. Further, that the social and emotional attachment variables had no statistically significant relationship with religious, work and student identity salience is a notable one, since this research is the first of which we are aware that elicits the number and strength of ties of RBOs individually.

DISCUSSION

The purpose of this study was to dig more deeply into the role of personal networks in shaping an individual's identity. Although social psychologists have previously recognized the theoretical importance of social networks on identity formation, few researchers have moved beyond the metaphor of networks when studying the origins of self-structure. In this paper, we elicited comprehensive ego-network structures, using these to distinguish between two complex features of personal networks that should be essential to the internalization of roles into the self-concept. Whereas our attachment dimension can be viewed as a formal network operationalization of social and emotional attachment to role-based others, we raised the additional question of whether the embeddedness or "reach" of role-based others (as opposed to just the proportion and closeness of role-based others) could uniquely affect the formation of self-structure.

The results indicate that, independent of the strength and proportion of ties to RBOs and the quantity of time spent in a given role, the extent to which RBOs are tied to the rest of one's network is associated with the salience of the religious, work and student identities. The fact that the relationship between the embeddedness of RBOs and identity salience is robust across all three identities strongly suggests that this is a general social process involving personal networks and the self. Importantly, the three identities studied here are composed of widely differing cultural meanings and are enacted within distinctive institutional contexts. Thus, embeddedness processes do not appear to be

context-specific. However, further research is needed to test whether the embeddedness mechanism applies to other institutional contexts not examined here.

Meanwhile, we consistently found that strength and proportion of ties to RBOs were not significantly associated with religious, student, and work identity salience, which is noteworthy given the theoretical importance of social and emotional attachment for identity theory (e.g., Burke and Stets 2009; Stryker 1980). We should be clear, however, that even though these results seemingly fail to support what identity theorists predict with respect to social and emotional attachment and salience, our analysis is not in any way a direct test of IT itself. Rather, our point is that, by using a formal network approach, (1) IT's conception's of commitment can be operationalized in concrete network terms and that (2) other aspects of network structure turn out to be more important than what is implied by social and emotional attachment. In sum, our findings suggest that ties between RBOs and NRBOs are important for determining role-identity salience and that commitment-based processes, when formalized into aspects of network structure, are not.

We are aware of two basic limitations with this analysis. First, given the fact that this research draws from cross-sectional data, we have no straightforward way of establishing direction of causality. In turn, a possible alternative to the claims we made here is that the salience of a given identity affects how one forms role-based social ties. For example, individuals with salient identities may be more likely to foster and encourage relationships between people in their role-based group and others at large in their personal social network. While previous research has indeed found a reciprocal link

between role-based ties and identity salience, the direction of the effect seems to operate largely from the former to the latter rather than vice-versa (Stryker and Serpe 1982). To be sure, however, the issue of causal directionality does not strictly relate to our key finding, which is that the link between embeddedness and identity salience is observed net of proportion and strength of ties to role-based others as well as frequency of role-behavior. In other words, if identity salience drives the formation of ties, one would expect that identity salience would be associated with both the proportion of ties and embeddedness.

Second, while our method for generating personal networks seems to have been successful in eliciting an extensive sample of social contacts, it has not been subjected to the same degree of methodological scrutiny as other commonly used name-generators. Thus, the validity of our name-generator is still largely an open question. However, additional analyses indicated that the networks generated using our approach display similar patterns of network composition to those generated using validated name generators (e.g., the “discuss important matters” name generator used in the 1985 and 2010 GSS networks modules).¹¹ Additionally, post-session interviews conducted during a pilot study using our name-generator revealed no systematic bias (aside from tie strength) in terms of who was included on the “guest list.”¹²

Another potential issue related to the survey instrument is the possibility of respondent fatigue. While we took every effort to set up the survey in a way that maximizes efficiency and reduces respondent burden, it is nonetheless still true that respondents could receive up to 1,225 alter-alter dyads to evaluate over the course of the

survey. However, additional analyses investigating potential fatigue effects revealed little evidence of fatigue-induced error.¹³

CONCLUSION: NETWORK MECHANISMS AND THE MICRO-MACRO LINK

Although previous work in identity theory has done much to enhance our understanding of the link between social ties and the self, the issue of *how* social ties impact the self-structure is still largely unresolved. Thus, more work is needed to specify and empirically examine the mechanisms that are driving this relationship. This study distinguishes between an attachment approach (or bonding mechanism) and an embeddedness perspective, which instead highlights environmental adaptation and diffusion mechanisms. Although more research is needed to fully understand the different mechanisms that are driving the relationship between social networks and the self, our findings suggest that social network analysis may provide a useful tool in this endeavor.

Additionally, this research may provide important clues regarding the link between Stryker's structural identity theory and micro-level theories of identity (e.g., Burke 1991; Burke and Stets 2009; Heise 1979, 2007), which describe how the identities of those in social encounters produce social behavior. Because of their focus on how the interplay between features of social encounters and identity affect social behavior, the ways in which social structure affects the meanings that are found in situations are generally outside the scope of these micro-level theories (Smith-Lovin 2007). Thus, while these theories have done much to advance our understanding of the proximate causes of behavior, we echo the recent call for a renewed focus on the relationship

between distal, macro-structural effects on self and social behavior (Smith-Lovin 2007; Stryker and Burke 2000). Our research, which puts theoretical primacy on the “ecology of encounters” where social (and symbolic) interaction actually occurs (Smith-Lovin 2007), provides one step forward in the broad agenda to clarify how the structure of personal networks can affect the self. Future research is needed to more fully explore the interplay between structural features of social networks and opportunity structures for self-verification in social interaction.

NOTES

1. This approach aligns with the general view espoused by identity theorists that the self is composed of multiple identities that are attached to multiple roles through patterned ties to role-based others, which in turn are embedded in the larger network of social ties that comprise one’s personal social network (Owens, Robinson and Smith-Lovin 2010).

2. Although social attachment is generally conceptualized as the raw number of ties to RBOs (e.g., Stryker and Serpe 1982, 1994; Serpe 1987; Callero 1985; Nuttbrock and Fruediger 1991), figure 1 suggests that an alternative operationalization of social attachment may be warranted. Recall that commitment refers to the loss that one would incur upon leaving a social role, and therefore forgo the relationships that they have to RBOs. As described earlier, networks B and C in figure 1 would be considered equivalent using the traditional approach to commitment given that both networks contain three RBOs. But networks B and C clearly raise the issue of whether the proportion of ties to RBOs better suits the idea of “loss incurred.” Because person B is situated in a six person social circle versus a 12 person circle, person B stands to lose half of their social contacts by forgoing relationships to RBOs whereas the actor represented in network C only stands to lose one-quarter of their network. Accordingly, we use a proportional measure of social attachment to account for these potentially important differences.

Additionally, we suggest that a proportional measure provides a better theoretical fit with IT’s view of self-structure. Since IT views the self-structure as being hierarchically organized, identity salience is a relative construct, meaning that an identity’s position in the salience hierarchy is contingent upon its level of salience *relative to other identities*. Thus, it seems reasonable to assume that social attachment is a similarly relative construct. To illustrate, imagine someone whose network consists of only three school-based ties and three work-based ties (as in figure 1b, assuming the

black nodes represent school-based ties and the white nodes represent work-based ties). If this person were to form additional relationships with people from each group at the same rate, the proportional measure of social attachment for each identity would remain unchanged. On the other hand, a count-based approach would assume that social attachment for both identities is increasing *even though the salience hierarchy would remain unchanged*.

3. This is consistent with Granovetter's (1985: 490) discussion of how information gathered from past dealings with an individual is superior to information gathered from a third party because of the fact that it is "richer, more detailed, and known to be accurate."

4. Qualtrics™ hosted the survey and managed the recruitment and compensation of participants. Participants either signed up directly with one of Qualtrics' online vendors or they responded to an advertisement posted on select websites (e.g. airline company websites for VIP members and restaurant club members). The questionnaire was completed online and participants were compensated with cash-equivalent rewards (including airline miles, magazine subscriptions, and gift cards).

5. Although our sample is a convenience sample, and not representative of the U.S. population at large, we do not view this as a problem for the issue at hand. Since the purpose of this research is to (1) to examine an alternative, network-based specification of the effect of interpersonal social relations on the self, and (2) examine the relative effects of attachment and embeddedness on role internalization, our ability to generalize to a larger population is not of great importance. Additionally, restricting our sampling frame to a relatively specific demographic population allows us to tailor the identity salience items to include identities that are likely to be relevant to a large portion of the respondents.

6. We included these additional identities in our survey because it is useful to have respondents rate multiple identities so that they can have a way to "anchor" their responses to other identities. Although we—and others (e.g., Merolla et al. 2012)—have abandoned the traditional rank-ordering approach to measuring identity salience for methodological reasons, we argue that giving respondents a set list of common identities aids in providing an adequate fits to the theoretical construct of "salience hierarchy," since it allows them to anchor their responses to the identities of theoretical interest relative to other identities.

7. These calculations are made using only alter-alter ties. This measure is akin to a group-level measure of centrality (excluding ego), where only non-redundant ties are considered. Non-redundancy in this case refers to the fact that NRBOs are viewed as either tied to the role-based group or not (i.e., the measure is not weighted by the number of ties a given NRBO has to the role-based group).

8. We collapse "almost every week," "every week," and "several times a week" into a single category.

9. For those currently enrolled in school, education indicates their expected degree.

10. Analyses where respondents without any RBOs are given a value of 0 for average strength of ties provide substantively identical results. We chose to present the models

excluding these observations so as to avoid building any unfounded assumptions regarding the strength of ties to role-based others into our analyses.

11. To better understand the nature of the networks elicited by our vignette name generator, we compare our results to those produced by traditional name generators. Specifically, we compare our results (available upon request) to the data from the networks module in the General Social Survey (1985 & 2010); the Northern California Community Survey (NCCS) survey conducted by Fischer (1977; see Fischer 1982); data from the Internet and American Life Project (IALP) conducted by Hampton (2008; see Hampton et al. 2011); as well as an online survey conducted by Time-sharing Experiments in the Social Sciences (TESS) designed by Brashears (2010; see Brashears 2011). These five surveys are publically available and include at least some young adult respondents. To match the sample used in our study, the summary statistics for the GSS 1985 and NCCS 1977 are based only on the 18-24 year old, childless respondents in each of the three surveys. For the 2010 GSS, however, we expanded the subsample to those 18-30 years of age to achieve a reasonable sample size and since there was no data available on parenthood for the 2010 TESS and 2008 IALP studies, we include all 18-24 year olds in the table.

12. Respondents were asked how accurately the guest list reflected their personal social network (defined as the people who matter in their life). They were also asked if they could think of somebody or a group of people from their social network who they did not put on the guest list. The only common response was acquaintances or people that they are less close to.

13. To examine fatigue, we investigated whether the likelihood of a respondent reporting an alter-alter tie decreased as the survey progressed. As described in appendix A, respondents were asked if pairs of alters would “stop and chat on the street” in four segments: part 6 (Guest-to-Guest dyads), part 8 (Within-Role Contact-to-Contact dyads), part 9 (Guest-to-Contact dyads), and part 11 (Between-Role Contact-to-Contact dyads). Since fatigue should be most pronounced in part 11, the last segment of alter-alter questions towards the very end of the survey, we focused our efforts on understanding the correlates of high/low alter-alter density in part 11. Our findings (the details of which are available upon request) indicate that a) time to completion increases steadily as number of alters increases (indicating that respondents are not simply clicking through after a certain amount of time and energy is investigated), b) there is no evidence of within page decrease in density, and c) while there is marginal support for the hypothesis that density decreases for part 11 as guest list size increases, the magnitude of the effect is quite small. Further, the mean time to completion for this survey was 25 minutes and the median time was 19 minutes, which is substantially shorter than the average time it takes to complete large-scale face-to-face surveys such as the General Social Survey.

REFERENCES

- Benson, Peter L., Michael J. Donahue, and Joseph A. Erickson. 1989. *Research in the Social Scientific Study of Religion* 1(1): 153-81.
- Borgatti, Stephen P. and Virginie Lopez-Kidwell. 2011. "Network Theory." pp. 40-51 in *Handbook of Social Network Analysis* edited by P. J. Carrington and J. Scott. New York: Sage.
- Brashears, Matthew E. 2010. "Anomia and the Sacred Canopy: Testing a Network Theory." *Social Networks*. 32(3): 187-196.
- Brashears, Matthew E. 2011. "Small Networks and High Isolation? A Reexamination of American Discussion Networks." *Social Networks* 33:331-341.
- Burke, Peter J. 1980. "The Self: Measurement Implications from an Interactionist Perspective." *Social Psychology Quarterly* 43(1):18-29.
- Burke, Peter J. 1991. "Identity Processes and Social Stress." *American Sociological Review* 56(6): 836-849.
- Burke, Peter J., and Donald C. Reitzes. 1981. "The Link Between Identity and Role Performance." *Social Psychology Quarterly* 44(2): 277-290.
- Burke, Peter J., and Donald C. Reitzes. 1991. "An Identity Theory Approach to Commitment." *Social Psychology Quarterly* 54(3): 239-251.
- Burke, Peter J., and Jan E. Stets. 2009. *Identity Theory*. Oxford: Oxford University Press.
- Burke, Peter and Judy Tully. 1977. "The Measurement of Role/Identity." *Social Forces* 55(4): 881-97.
- Callero, Peter L. 1985. "Role-Identity Salience." *Social Psychology Quarterly* 48(3): 203-215.
- Cooley, Charles H. *Human Nature and Social Order*. New York: Scribner.
- DiPrete, Thomas A., Andrew Gelman, Tyler McCormick, Julien Teitler, and Tian Zheng. 2011. "Segregation in Social Networks Based on Acquaintanceship and Trust." *American Journal of Sociology* 116(4): 1234-83.
- Fischer, Claude S. 2009. "The 2004 GSS Finding of Shrunken Social Networks: An Artifact?" *American Sociological Review* 74(4): 657-669.
- Fischer, Claude S. 1982. *To dwell among friends: Personal networks in town and city*. Chicago: University of Chicago Press.
- Gibson, Harry M., Leslie J. Francis, and Paul R. Pearson. 1990. "The relationship between social class and attitude toward Christianity among fourteen- and fifteen-year-old adolescents." *Personality and Individual Differences* 11(6): 631-35
- Granovetter, Mark S. 1973. "The Strength of Weak Ties." *The American Journal of Sociology*, 78(6): 1360-1380.
- Granovetter, Mark S. 1983. "The Strength of Weak Ties: A Network Theory Revisited." *Sociological Theory* 1(1): 201-233.
- Granovetter, Mark S. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91(3): 481-510.
- Hampton, Keith N., Lauren F. Sessions, and Eun Ja Her. 2011. "Core Networks, Social Isolation, and New Media." *Information, Communication & Society* 14(1): 130-155.
- Haynie, Dana L. 2001. "Delinquent Peers Revisited: Does Network Structure Matter?" *American Journal of Sociology*, 106(4): 1013-1057.
- Haynie, Dana L. 2002. "Friendship Networks and Delinquency: The Relative Nature of Peer Delinquency." *Journal of Quantitative Criminology*, 18(2): 99-135.

- Heise, David R. 1979. *Understanding Events: Affect and the Construction of Social Action*. New York: Cambridge University Press.
- Heise, David R. 2007. *The Expressive Order: Confirming Sentiments in Social Actions*. New York: Springer.
- Hoelter, John W. 1983. "The Effects of Role Evaluation and Commitment on Identity Salience." *Social Psychology Quarterly* 46(2): 140-47.
- Holland, Paul W. and Samuel Leinhardt. 1972. "Reply: Some Evidence on the Transitivity of Positive Interpersonal Sentiment." *American Journal of Sociology* 77(6): 1205-1209.
- Holland, Paul W. and Samuel Leinhardt. 1977. "A Dynamic Model for Social Networks." *The Journal of Mathematical Sociology* 5(1): 5-20.
- Hogan, Bernie, Juan Antonio Carrasco, and Barry Wellman. 2007. "Visualizing Personal Networks: Working with Participant-aided Sociograms." *Field Methods* 19(2): 116-144.
- Lee, Barrett A., Karen E. Campbell, and Oscar Miller. 1991. "Racial Differences in Urban Neighboring." *Sociological Forum* 6(3): 525-550.
- Lin, Nan, and Mary Dumin. 1986. "Access to Occupations Through Social Ties." *Social Networks* 8(4): 365-385.
- Marin, Alexandra. 2004. "Are Respondents More Likely to List Alters with Certain Characteristics?: Implications for Name Generator Data." *Social Networks* 26(4): 289-307.
- Marin, Alexandra, and Barry Wellman. 2011. "Social Network Analysis: An Introduction." Pp. 11-25 in *The SAGE Handbook of Social Network Analysis*, edited by P. J. Carrington and J. P. Scott. London: Sage.
- Marin, Alexandra, and Keith N. Hampton. 2007. "Simplifying the Personal Network Name Generator: Alternatives to Traditional Multiple and Single Name Generators." *Field Methods* 19(2): 163-193.
- Marsden, Peter V. 1987. "Core Discussion Networks of Americans." *American Sociological Review* 52(1): 122-131.
- Marsden, Peter V. 1990. "Network Data and Measurement." *Annual Review of Sociology* 16: 435-463.
- Marsden, Peter V. 2005 "Recent Developments in Network Measurement." Pp. 8-30 in *Models and Methods in Social Network Analysis*, edited by P. J. Carrington, J. P. Scott, and S. Wasserman. New York: Cambridge University Press.
- Marsden, Peter V. 2011. "Survey Methods for Network Data." Pp. 370-388 in *The SAGE Handbook of Social Network Analysis*, edited by J. P. Scott and P. J. Carrington. New York: Sage.
- McCall, George J., and J. L. Simmons. 1978. *Identities and Interactions: An Examination of Human Associations in Everyday Life*. New York: The Free Press.
- McCallister, Lynne, and Claude S. Fischer. 1978. "A Procedure for Surveying Personal Networks." *Social Methods and Research* 7(2): 131-148.
- McFarland, Daniel, and Heili Pals. 2005. "Motives and Contexts of Identity Change." *Social Psychology Quarterly* 68(4): 289-315.
- McPherson, Miller, Lynn Smith-Lovin, and Matthew E. Brashears. 2006. "Social Isolation in America: Changes in Core Discussion Networks Over Two Decades." *American Sociological Review* 71(3): 353-375.

- McPherson, Miller, Lynn Smith-Lovin and Matthew E. Brashears. 2008. "Erratum: Social Isolation in America: Changes in Core Discussion Networks Over Two Decades." *American Sociological Review* 73: 1022.
- Mead, George Herbert. 1934. *Mind, Self and Society*. Chicago: University of Chicago Press.
- Merolla, David M., Richard T. Serpe, Sheldon Stryker, and P. Schultz. 2012. "Structural Precursors to Identity Processes The Role of Proximate Social Structures." *Social Psychology Quarterly* 75(2): 149-172.
- Mollenhorst, Gerald, Beate Völker, and Henk Flap. 2008. "Social Contexts and Personal Relationships: The Effect of Meeting Opportunities on Similarity for Relationships of Different Strength." *Social Networks* 30(1): 60-68.
- Mollenhorst, Gerald, Beate Völker, and Henk Flap. 2008. "Social Contexts and Core Discussion Networks: Using a Choice Approach to Study Similarity in Intimate Relationships." *Social Forces* 86(3): 937-965.
- Moody, James, and Douglas R. White. 2003. "Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups." *American Sociological Review* 68(1): 103-127.
- Moore, Gwen. 1990. "Structural Determinants of Men's and Women's Personal Networks." *American Sociological Review* 55(5): 726-735.
- Nuttbrock, Larry and Patricia Freudiger. 1991. "Identity Salience and Motherhood: A Test of Stryker's Theory." *Social Psychology Quarterly* 54(2): 146-157.
- Owens, Timothy, Dawn Robinson, and Lynn Smith-Lovin. 2010. "Three Faces of Identity." *Annual Review of Sociology* 36: 477-499.
- Portes, Alejandro, and Julia Sensenbrenner. 1993. "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action." *American journal of sociology* 98(6): 1320-1350.
- Regnerus, Mark D. 2007. *Forbidden Fruit: Sex and Religion in the Lives of American Teenagers*. New York: Oxford University Press.
- Robinson, Dawn and Lynn Smith-Lovin. 1992. "Selective Interaction as a Strategy for Identity Maintenance: An Affect Control Model." *Social Psychology Quarterly* 55(1): 12-28.
- Rosenberg, Morris. 1979. *Conceiving the Self*. New York: Basic Books.
- Serpe, Richard T. 1987. "Stability and Change in Self: A Structural Symbolic Interactionist Explanation." *Social Psychology Quarterly* 50(1): 44-55.
- Serpe, Richard T., and Sheldon Stryker. 1987. "The Construction of Self and the Reconstruction of Social Relationships." *Advances in Group Processes* 4: 41-66.
- Serpe, Richard T., and Sheldon Stryker. 1993. "Prior Social Ties and Movement into New Social Relationships." *Advances in Group Processes* 10: 283-304.
- Smith-Lovin, Lynn. 2003. "Self, Identity and Interaction in an Ecology of Identities." Pp. 167-178 in *Advances in Identity Theory and Research*, edited by P. J. Burke, T. J. Owens, R. T. Serpe and P. A. Thoits. New York: Plenum Publishers,.
- Smith-Lovin, Lynn. 2007. "The Strength of Weak Identities: Social Structural Sources of Self, Situation and Emotion." *Social Psychology Quarterly* 70(2): 106-124.
- Stets, Jan E, and Peter J. Burke. 2000. "Identity Theory and Social Identity Theory." *Social Psychology Quarterly* 63(3): 224-237.
- Stets, Jan E. "Examining Emotions in Identity Theory." 2005. *Social Psychology Quarterly*, 68(1): 39-56.
- Stets, Jan E., and Chris F. Biga. 2003. "Bringing Identity Theory into Environmental Sociology." *Sociological Theory* 21(4): 398-423.

- Stets, Jan E., Michael J. Carter, Michael M. Harrod, Christine Cerven, and Seth Abrutyn. 2008. "The Moral Identity, Status, Moral Emotions, and the Normative Order." Pp. 227-251 in *Social Structure and Emotion*, edited by J. Clay-Warner, D. T. Robinson. Oxford: Elsevier.
- Stryker, Sheldon. 1968. "Identity Saliency and Role Performance." *Journal of Marriage and the Family* 30(4): 558-564.
- Stryker, Sheldon. 1980. *Symbolic Interactionism: A Social Structural Version*. Menlo Park: Benjamin Cummings.
- Stryker, Sheldon, and Peter Burke. 2000. "The Past, Present, and Future of an Identity Theory." *Social Psychology Quarterly* 63(4): 284-297.
- Stryker, Sheldon, and R.T. Serpe. 1982. "Commitment, Identity Saliency, and Role Behavior: Theory and Research Example." In *Personality, Roles and Social Behavior*, edited by W. Ickes and Knowles E., 199-218. New York: Springer-Verlag.
- Stryker, Sheldon, and Richard T. Serpe. 1994. "Identity Saliency and Psychological Centrality: Equivalent, Overlapping, or Complementary Concepts?" *Social Psychology Quarterly* 57(1): 16-35.
- Stryker, Sheldon, Richard T. Serpe, and Matthew O. Hunt. 2005. "Making Good on a Promise: The Impact of Larger Social Structures on Commitments." *Advances in Group Processes* 22: 93-123.
- Swann, William B., Jr. 1983. "Self-Verification: Bringing Social Reality into Harmony with the Self." Pp. 33-66 in *Psychological Perspectives on the Self*, edited by J. Suls and A. G. Greenwald. Hillsdale, NJ: Earlbaum.
- Swann, William B., Jr. 1999. *Resilient Identities: Self, Relationships, and the Construction of Social Reality*. New York: Basic Books.
- Turner, Ralph H. 1962. "Some Family Determinants of Ambition." *Sociology and Social Research* 46(4): 397-411.
- Uzzi, Brian. 1996. "The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect." *American Sociological Review* 61(4): 674-698.
- Uzzi, Brian. 1999. "Embeddedness in the Making of Financial Capital: How Social Relations and Networks Benefit Firms Seeking Financing." *American Sociological Review* 64(4): 481-505.
- Walker, Mark H. 2010. "The Embedded Self: Investigating The Relationship between Network Structure and Self-Structure." MA Thesis, University of Iowa, Iowa City, IA.
- Wasserman, Stanley and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press
- Wellman, Barry. 1979. "The Community Question: The Intimate Networks of East Yorkers." *American Journal of Sociology*, 14(3): 1201-1231.
- Wilson, John and Darren E. Sherkat 1994. "Returning to the Fold." *Journal for the Scientific Study of Religion*, 33(2): 148-161.

AUTHOR BIO

Mark H. Walker is a graduate student in the department of sociology at the University of Iowa. His research interests include self and identity, social networks, and the measurement of personal social networks. His dissertation investigates the interplay between identity conflict, personal network structure, and psychological well-being.

Freda B. Lynn is an assistant professor of sociology at the University of Iowa. Her research interests include networks, status dynamics, and inequality. She is currently engaged in a network-based study of citation patterns funded by the National Science Foundation. Her recent work on status appears in the *American Journal of Sociology* and the *Annual Review of Sociology*.

Appendix A: Survey Instrument

Below is an abbreviated version of the questions and instructions used in the online survey. Items appear in the same order as the actual survey with skip patterns indicated in bold italics. Line breaks indicate changes in screens (i.e. questions appearing between lines appear together on one screen). The section headers used here (e.g. Part I, Part II) are for organizational purposes only and do not appear in the online survey. Access to the actual online survey is available upon request.

PART 1. ROLE BEHAVIOR

[Five questions about role behavior (e.g., “How often do you attend religious services?”), with the possibility of two additional follow-up questions.]

PART 2. VIGNETTE NAME GENERATOR

We are interested in learning about the people in your life. This survey will ask that you provide the names (first name and last initial only) of some of your social contacts.

As you take this survey, keep in mind that:

- Your responses are completely anonymous and confidential. Your responses will be used for research purposes only.
- We will not attempt to contact any of the individuals you name.

We want to learn about the people in your life. Imagine that you have won an award that you are very excited about. Those presenting the award to you want to throw a party in your honor. They will pay for all of the expenses related to the party, including food, drinks, travel and housing for guests. Who would you invite? [Graphic of guest list entry form]

[INSTRUCTIONAL SLIDE: Duplicate names not allowed.]

Now it's time to create your guest list.

Remember, you've just won an award that you are very excited about. Those presenting the award to you want to throw a party in your honor. Imagine that you and your guests will NOT have to pay for any of the expenses related to the party—including food, drinks, travel and housing costs. Think carefully about all the people you want to celebrate with. Who would you invite?

Please list only the first name and last initial for each person you want to invite. You can list up to 25 people. Remember, no duplicates allowed.

Guest 1	<input type="text"/>
Guest 2	<input type="text"/>
Guest 3	<input type="text"/>
...	<input type="text"/>
Guest 25	<input type="text"/>

[Alters elicited in this segment are referred to hereafter as $guest_1, \dots, guest_k$.]

PART 3. NAME INTERPRETERS

Only if participants have at least one guest list entry:

From time to time, most people discuss important matters with other people. With whom on this list do you discuss important matters? [Check box format with instructions]

In the past six months, with whom on this list have you spent time socially?

Only if participants currently work for pay:

Who on this list is a co-worker?

Who on this list is a family member?

Only if participants are currently enrolled in school:

In the past six months, with whom on this list have you spent time doing schoolwork?

Only if participants attend religious services (i.e. more than “Never”):

Which of the people on your list attend the same religious services as you?

PART 4. NAME GENERATOR PROBES

Thank you for your responses. Your guest list is displayed in the black box below.

In the next section, we are going to ask you to name people from different social groups that you interact with on a regular basis, but did not put on your list.

Are there other family members in your life?

Can you think of other members of your family that you see or talk to on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them). [Respondent given five textboxes to enter names.]

Only if participants currently work for pay:

Other co-workers in your life?

Can you think of other individuals at work that you see or talk to on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them). [Respondent given five textboxes to enter names.]

Only if participants attend religious services (i.e. more than “Never”):

Other religious contacts in your life?

Can you think of other people who attend the same religious services as you that you see or talk to on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them). [Respondent given five textboxes to enter names.]

Other social contacts in your life?

Can you think of other individuals with whom you spend time socially on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them). [Respondent given five textboxes to enter names.]

Only if participants are currently enrolled in school:

Other school contacts in your life?

Can you think of other people you've done schoolwork with that you see or talk to on a regular basis who are not on this list? If yes, please name them below (regardless of how close you are to them). [Respondent given five textboxes to enter names.]

[All alters elicited from these probes are referred to hereafter as $contact_1, \dots, contact_k$.]

PART 5. ADDITIONAL NAME INTERPRETERS

Please indicate which of these individuals are female. [List of all guests and contacts with check box format]

Please indicate which of these people are a different race than you. [List of all guests and contacts with check box format]

In many cases, people in your life fall into more than one social group. For example, if you work with your best friend, then s/he could be a co-worker as well as somebody you spend time with socially. Please indicate if these individuals belong to multiple groups (check all that apply).

[Circles are pre-checked based on responses given in Part 4.]

	Family Members	Co-Workers	Attend Same Religious Services	Spent Time with Socially	Did School Work Together
Contact 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contact k	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How close are you emotionally with the people listed below?

	Not at all close (1)	Somewhat close (2)	Close (3)	Extremely Close (4)
Guest 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guest k	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contact 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contact k	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PART 6. ALTER-ALTER TIES: GUEST DYADS

Only if participants named two or more guests:

Do these pairs know each other well enough to stop and chat if they passed one another on the street?

- Yes, they would stop and chat.
- Guest 1 and Guest 2
- ...
- Guest 1 and Guest k
- ...
- Guest $k-1$ and Guest k

PART 7. SELF-RELATED EMOTIONS

[Three blocks of questions (19 total) regarding self-esteem and locus of control.]

PART 8. ALTER-ALTER TIES: WITHIN-ROLE CONTACT DYADS

Only if participants named two or more contacts from each probe [family, work, religion, friend, student]:

Do these pairs know each other well enough to stop and chat if they passed on another on the street?

- Yes, they would stop and chat.
- Family Contact 1 and Family Contact 2
- ...
- Family Contact 1 and Family Contact k
- ...
- Family Contact $k-1$ and Family Contact k

[Repeat for work, religion, friend, and student contacts.]

PART 9. ALTER-ALTER TIES: GUEST-CONTACT DYADS

Only if participants named at least one guest and at least one contact from each probe [family, work, religion, friend, student]:

Do these pairs know each other well enough to stop and chat if they passed on another on the street?

- Yes, they would stop and chat.
- Guest 1 and Family Contact 1
- ...
- Guest 1 and Family Contact k
- ...
- Guest k and Family Contact k

[Repeat for work, religion, friend, and student contacts.]

PART 10A. SALIENCE [location in survey randomly alternated with part 10B]

Now, we would like you to think about meeting people for the first time in various settings. You want to tell them about yourself so that they will really know you, but can only tell them a few things about yourself. How likely is it is that you would talk about the items listed below?

First, think about meeting a roommate for the first time. How likely is it that you would talk about the things listed below?

	Very Unlikely (1)	Unlikely (2)	Somewhat Unlikely (3)	Somewhat Likely (4)	Likely (5)	Very Likely (6)
Religion or Church Activities (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social activities (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School/Academics (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work/Career (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Think about meeting someone at a party. How likely is it that you would talk about the things listed below? [Same choice set as above]

Think about meeting a friend of a close friend. How likely is it that you would talk about the things listed below? [Same choice set as above]

Think about giving a short speech about oneself. How likely is it that you would discuss the items listed below? [Same choice set as above]

PART 11. ALTER-ALTER TIES: BETWEEN-ROLE CONTACT DYADS

Only if participants named at least one contact from each probe [family, work, religion, friend, student]:

Do these pairs know each other well enough to stop and chat if they passed on another on the street?

- Yes, they would stop and chat.
- | | |
|---|-----------------------|
| Family Contact 1 and Work Contact 1 | <input type="radio"/> |
| ... | <input type="radio"/> |
| Family Contact 1 and Work Contact k | <input type="radio"/> |
| ... | <input type="radio"/> |
| Family Contact k and Work Contact k | <input type="radio"/> |

[Repeat for Family-Religion, Family-Friend, Family-Student, Work-Religion, Work-Friend, Work-Student, Religion-Friend, Religion-Student, Friend-Student.]

PART 10B. PSYCHOLOGICAL CENTRALITY [location in survey randomly alternated with part 10A]

[Three blocks of questions (15 total) regarding the psychological centrality of religion, family, social activities, academics/school, and work/career.]

PART 12. DEMOGRAPHICS

[Seven questions about demographic characteristics with the possibility of up five follow-up questions.]

TABLES

Table 1. Demographic Characteristics (n=198)

Variable	
Race	
% White	69.70
% Non White	31.30
Sex	
% Male	45.95
% Female	55.05
Parental Income (\$)	
Mean	66,020
Median	50,000
Education	
Mean years	14.04
% 4-year degree or higher	29.80
Age	
Mean	22.05
Hours of Studying (N=90)	
Mean	13.33
Religious Attendance	
Mean	15.22
Hours of work per week (N=134)	
Mean	34.54

Table 2. Correlation Matrices for Key Independent Variables

	Emotional Attachment	Social Attachment	Embeddedness
Religious Identity			
Emotional Attachment	1		
Social Attachment	-0.3262	1	
Embeddedness	0.0035	0.4598	1
Student Identity			
Emotional Attachment	1		
Social Attachment	0.0263	1	
Embeddedness	0.3754	0.3383	1
Work Identity			
Emotional Attachment	1		
Social Attachment	0.1452	1	
Embeddedness	0.3863	0.5495	1

Note – Emotional attachment refers to the average strength of ties to role-based others and social attachment refers to the proportion of ties to role-based others.

Table 3. Network Characteristics (n=198)

Variable	Mean or %
Size	17.83
Density	0.40
Closeness	2.61
% Very close	23.61
% Close	29.80
% Somewhat close	30.58
% Not at all close	16.00

Table 4. Subgroup Characteristics and Identity Saliency

Subgraph	Religion (n=129)	Student (n=90)	Work (n=134)
Size	4.667	3.311	2.36
Density	.687 ^a	.575 ^b	0.697 ^c
Avg. Closeness	3.014 ^d	2.872 ^e	2.07 ^f
Prop. RB others	0.238	0.183	0.206
Embeddedness	0.579	0.524	0.404
Identity Saliency	2.73	4.36	4.49

^a n=81; ^b n=57; ^c n=79; ^d n=99; ^e n=76; ^f n=92

Table 5: OLS Regression Predicting Religious Identity Salience (N=99)

Variable	Model 1	Model 2	Model 3
Female	0.386 (0.258)	0.483 (0.259)	0.467 (0.253)
Age	0.060 (0.080)	0.084 (0.080)	0.097 (0.078)
Parental Income	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)
Education	-0.107 (0.067)	-0.107 (0.068)	-0.092 (0.067)
Married	0.793* (0.387)	0.545 (0.399)	0.519 (0.391)
White	-0.144 (0.290)	-0.279 (0.293)	-0.336 (0.288)
Religious Attendance (less than once a year = baseline)			
About once or twice a year	-0.556 (0.429)	-0.653 (0.427)	-0.662 (0.418)
Several times a year	-0.033 (0.431)	-0.062 (0.426)	-0.021 (0.417)
About once a month	1.112* (0.551)	1.116* (0.543)	1.227* (0.534)
2-3 times a month	0.536 (0.629)	0.440 (0.623)	0.435 (0.610)
Nearly every week +	1.331*** (0.370)	1.126** (0.377)	1.137** (0.369)
Network Size	-0.016 (0.013)	-0.017 (0.013)	-0.014 (0.013)
Emotional Attachment		-0.230 (0.184)	-0.314 (0.184)
Social Attachment		0.847 (0.605)	0.177 (0.669)
Embeddedness of RB group			1.201* (0.559)
Constant	3.258 (1.701)	3.276 (1.747)	2.344 (1.765)
R^2	0.412	0.442	0.472

* p<0.05; ** p<0.01; *** p<0.001, two-tailed tests

Table 6: OLS Regression Predicting Student Identity Saliency (n=76)

Variable	Model 1	Model 2	Model 3
Female	0.547** (0.204)	0.556** (0.209)	0.536* (0.204)
Age	-0.007 (0.064)	-0.006 (0.065)	-0.015 (0.064)
Parental Income	-0.001 (0.002)	-0.001 (0.002)	0.000 (0.002)
Education	0.029 (0.052)	0.029 (0.053)	0.048 (0.052)
Married	0.027 (0.336)	0.050 (0.345)	0.016 (0.337)
White	-0.345 (0.214)	-0.333 (0.220)	-0.356 (0.215)
Hours of Studying	0.021 (0.012)	0.021 (0.013)	0.019 (0.012)
Network Size	0.024* (0.010)	0.026* (0.011)	0.020 (0.011)
Emotional Attachment		0.048 (0.130)	-0.086 (0.142)
Social Attachment		0.122 (0.626)	-0.447 (0.668)
Embeddedness of RB group			0.878* (0.420)
Constant	3.563* (1.398)	3.355* (1.508)	3.312* (1.470)
R^2	0.258	0.260	0.307

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed tests

Table 7: OLS Regression Predicting Work Identity Saliency (n=92)

Variable	Model 1	Model 2	Model 3
Female	0.702*** (0.192)	0.660*** (0.193)	0.744*** (0.192)
Age	0.102 (0.059)	0.101 (0.058)	0.123* (0.058)
Parental Income	0.001 (0.002)	0.000 (0.002)	0.000 (0.002)
Education	0.036 (0.050)	0.043 (0.050)	0.058 (0.049)
Married	-0.307 (0.324)	-0.343 (0.323)	-0.267 (0.317)
White	0.114 (0.232)	0.126 (0.231)	0.086 (0.226)
Hours of Studying	0.003 (0.008)	0.004 (0.008)	0.005 (0.008)
Network Size	0.019 (0.010)	0.027* (0.011)	0.031** (0.011)
Emotional Attachment		0.112 (0.108)	0.012 (0.114)
Social Attachment		0.872 (0.647)	0.079 (0.723)
Embeddedness of RB group			0.863* (0.385)
Constant	0.872 (1.437)	0.224 (1.477)	-0.653 (1.493)
R^2	0.258	0.285	0.327

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed tests

FIGURES

Figure 1. Egocentric network examples

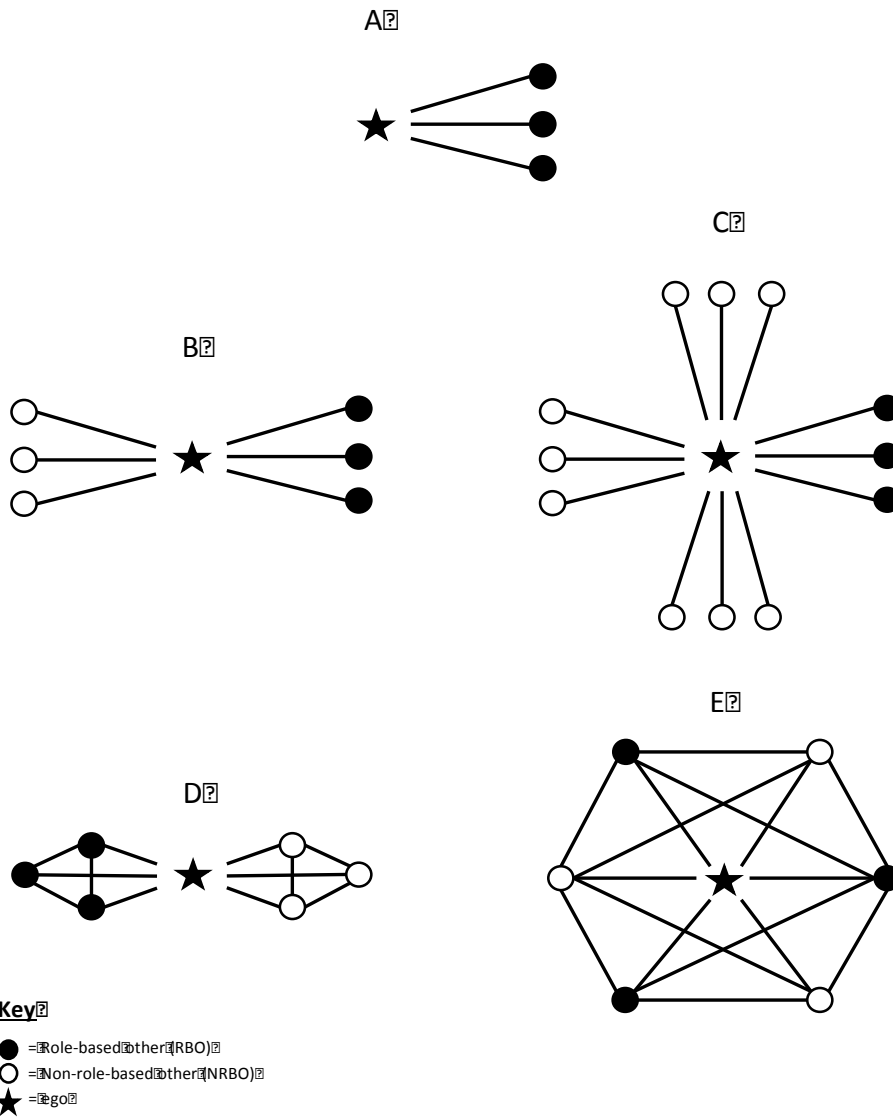
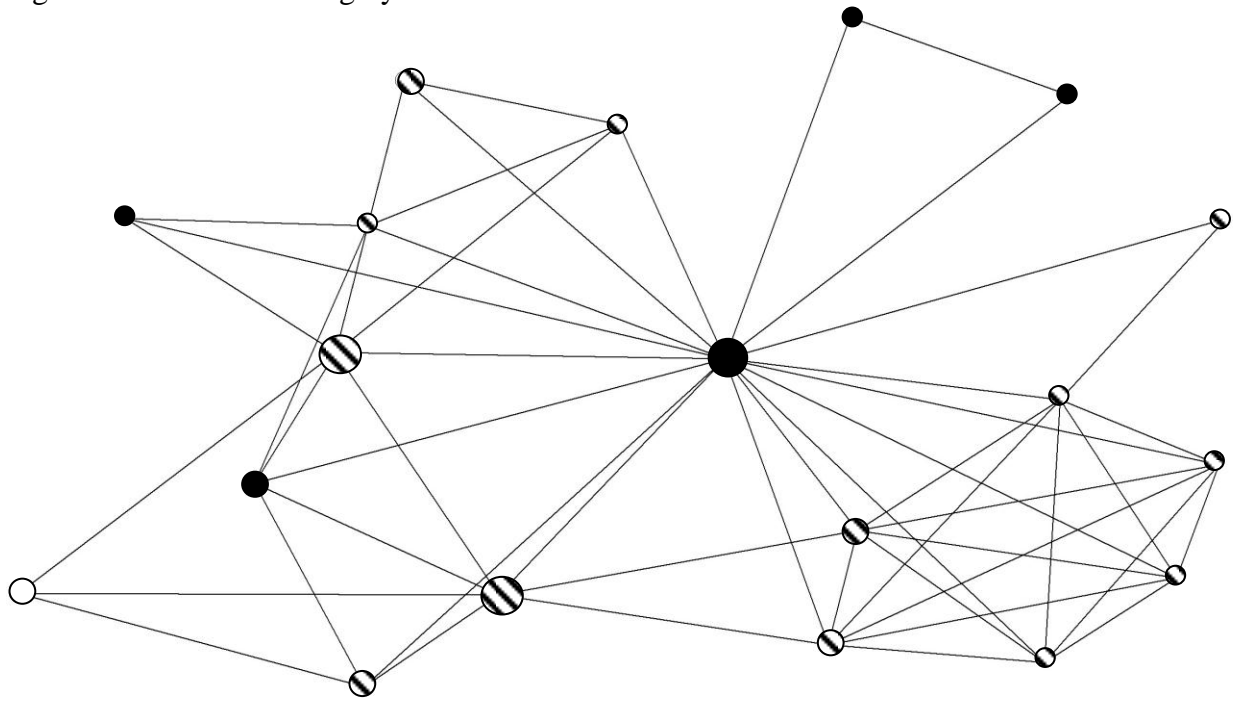


Figure 2. Network with highly embedded role-based others.

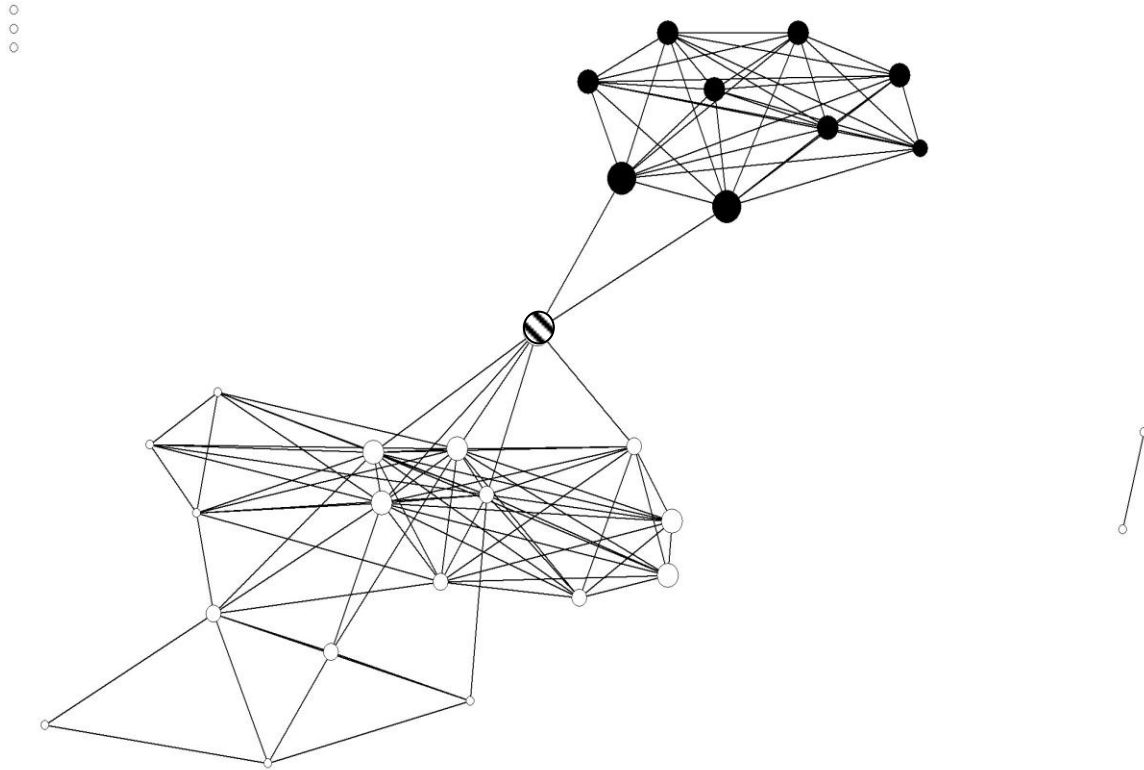


Key

- = Role-based other (RBO)
- = Non-role-based other (NRBO)
- ◐ = NRBO tied to role-based group

*Note: ego not included in this figure. Node size reflects strength of tie between ego and alter.

Figure 3. Network with low embeddedness.



Key

- = Role-based other (RBO)
- = Non-role-based other (NRBO)
- ◐ = NRBO tied to role-based group

*Note: ego not included in this figure. Node size reflects strength of tie between ego and alter.